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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/701,784
Filing Date: November 05, 2003
Appellant(s): COFFMAN ET AL.

Gaspare J. Randazzo
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed May 21, 2008 appealing from the Office action mailed March 4, 2008.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,311,150	Ramaswamy et al.	10-2001
4,974,191	Amirgohdsi et al.	11-1990

Ramaswamy et al., " A pervasive Conventional Interface for information Interaction" Eurospeech 99, Budapest, Hungary (1999) pp 1-4

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 4, 10-12, 15, 21-23 and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by ***Ramaswamy*** (6,311,150).

As per claim 1, ***Ramaswamy*** discloses a method for recognizing commands in natural language, comprising the steps of:

Comparing an utterance to a plurality of handlers (column 2 lines 25-65, *an input utterance is translated using a natural language understanding engine comprised of a plurality of translator levels. Each level contains a plurality of categories with associated formal language commands stored as models (handlers). The categories with associated formal language commands are compared to the input utterance*);

Identifying a winning handler for decoding a command from the utterance, wherein the winning handler is identified by arbitration between results provided by at least two of the plurality of handlers, and the results provided at a first stage by at least one of the at least two of the plurality of handlers include one or more target utterances for the utterance (column 2 lines 25-65, *scores for the probability of a correct translation are determined for the categories and associated formal commands at each translator level (handler). The translator levels that do not output a do nothing command (winning handler) are used to determine the final formal command and output it at the last translator level (first stage)*); and

Decoding the command in accordance with the winning handler (column 2 lines 25-65, *scores for the probability of a correct translation are determined for the categories, then the highest scoring category, including the associated formal command, are passed to the next translator level. The translator levels that do not output a do nothing command (winning handler) are used to determine the final formal command and output it at the last translator level (first stage)*).

As per claim 12, ***Ramaswamy*** discloses a method for recognizing commands in natural language, comprising the steps of:

Providing a plurality of handlers trained to be responsive to given utterances (column 2 lines 25-65 and column 3 lines 10-20, *an input utterance is translated using a natural language understanding engine comprised of a plurality of translator levels.*

Each level contains a plurality of categories with associated formal language commands stored as models (handlers). The categories with the associated formal language commands are compared to the input utterance, where the categories are trained from training data from domain inputs);

Arbitrating against results provided by at least two of the plurality of handlers to determine a winning handler for an utterance, wherein the results provided at a first stage by at least one of the at least two of the plurality of handlers include one or more target utterances for the utterance (column 2 lines 25-65, *scores for the probability of a correct translation are determined for the categories and associated formal commands at each translator level (handler). The translator levels that do not output a do nothing command (winning handler) are used to determine the final formal command and output it at the last translator level (first stage)*); and

Decoding the command in accordance with the winning handler (column 2 lines 25-65, *scores for the probability of a correct translation are determined for the categories and associated formal commands at each translator level (handler). The translator levels that do not output a do nothing command (winning handler) are used to determine the final formal command and output it at the last translator level (first stage)*).

As per claim 23, ***Ramaswamy*** discloses a system for recognizing commands in natural language, comprising:

A speech recognizer for decoding language and semantic information in utterances provided by a user (column 4 lines 61-67); and

A dialog manager comprising a hierarchical ordering of handlers, each handler being trained to be responsive to decoded utterances wherein the dialog manager manages arbitration between results provide by the handlers to determine a winning handler for an utterance and decodes the command in accordance with the winning handler, wherein the results provided at a first stage include one or more target utterances for the utterance (column 2 lines 25-65 and column 3 lines 10-20, *an input utterance is translated using a natural language understanding engine comprised of a plurality of translator levels. Each level contains a plurality of categories with associated formal language commands stored as models (handlers). The categories with the associated formal language commands are compared to the input utterance, where the categories are trained from training data from domain inputs. Scores for the probability of a correct translation are determined for the categories and associated formal commands at each translator level (handler). The translator levels that do not output a do nothing command (winning handler) are used to determine the final formal command and output it at the last translator level (first stage)*)

As per claims 4, 15 and 26, ***Ramaswamy*** discloses the method as recited in claims 1, 12 and 23, wherein the handlers include an enabled or a disabled state and further comprising the step of presenting the utterance to enabled handlers (column 8 lines 25-

44), *the utterance is compared to categories at translator levels, therefore it is inherent that they are enabled*).

As per claims 10 and 21, ***Ramaswamy*** discloses the method as recited in claims 1 and 12, wherein the step of decoding further includes executing a command in accordance with the winning handler, responsive to the utterance (column 2 lines 25-40, *scores for the probability of a correct translation are determined for the categories, then the category and corresponding formal language command having the highest score is chosen, and passed to the next translator level. After the last level of translation, the formal language command is output to control an application*).

As per claims 11 and 22, ***Ramaswamy*** discloses a computer-readable medium, tangibly embodying a program of instructions executable by a computer to perform method step for recognizing commands in natural language as recited in claims 1 and 12 (column 1 lines 40-46).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 5 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over ***Ramaswamy***.

Ramaswamy discloses the method as recited in claims 4 and 15, but ***Ramaswamy*** does not disclose submitting the utterance to disabled container handlers to ensure submission of the utterance to child handlers. However, ***Ramaswamy*** does disclose hierarchical translators, where each level performs one portion of the translation and narrows the search space of formal commands for the subsequent levels (column 5 lines 40-53). Therefore each current level determines enabled or disabled categories, and thus formal commands, for use in the next level. ***Ramaswamy*** is also concerned with developing a robust system using techniques to improve the accuracy of the NLU system by checking for translation errors from previous levels (column 8 lines 25 - column 9 lines 40). Submitting the utterance to disabled handlers is one method of checking for translation errors, since an utterance correctly translated by child handlers of a disabled state and incorrectly translated by child handlers of an enabled state indicates a possible translation error in a parent handler.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to submit the utterance to disabled container handlers to ensure submission to child handlers in ***Ramaswamy***, since it would enable the system to check for translation errors, thus improving system performance.

Claims 2, 3, 6, 13, 14, 17, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over ***Ramaswamy*** in view of ***Amirghodsi*** (4,974,191).

As per claims 2, 13 and 24, ***Ramaswamy*** discloses the method as recited in claims 1, 12 and 23, however ***Ramaswamy*** does not disclose wherein the step of identifying includes resolving ties in the arbitration between handlers by employing a tie-breaker handler. ***Amirghodsi*** discloses a system that classifies objects of speech into classes and resolves a deadlock or tie when it occurs (column 39 lines 11-15). ***Amirghodsi*** discloses a natural language translation system for a human/computer interface (column 2 lines 15-18), and is therefore analogous art.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to resolve ties in the arbitration between handlers by employing a tie-breaker handler in ***Ramaswamy***, since it would enable the system to continue processing after reaching a deadlock, as indicated in ***Amirghodsi*** (column 39 lines 11-15), thus providing quick resolution of a tie, and increased processing speed.

As per claims 3, 14 and 25, ***Ramaswamy*** in view of ***Amirghodsi*** disclose the method as recited in claims 2, 13 and 24, however ***Ramaswamy*** does not disclose wherein the tie-breaker handler poses a question to a user to determine the winning handler. ***Amirghodsi*** discloses a system that classifies objects of speech into classes and resolves a deadlock or tie when it occurs (column 39 lines 11-15), as well as a system

that uses questions addressed to the user to gain further information in order to process a user request (column 7 lines 44-55 and 59-62). ***Amirghodsi*** discloses a natural language translation system for a human/computer interface (column 2 lines 15-18), and is therefore analogous art.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have a tie-breaker handler pose a question to a user to determine the winning handler in ***Ramaswamy***, since it would enable the system to gather further information, as indicated in ***Amirghodsi*** (column 7 lines 59-62), which would then be used to determine the correct handler, thus providing quick resolution of a tie, and increased processing speed.

As per claims 6 and 17, ***Ramaswamy*** discloses the method as recited in claims 1 and 12, however ***Ramaswamy*** does not disclose further comprising the step of submitting unresolved utterances to winning handlers of a previous utterance for decoding. ***Amirghodsi*** discloses a system that classifies objects of speech into classes and resolves a deadlock or tie when it occurs by assigning the last class reference to the remaining objects (column 39 lines 11-15). ***Amirghodsi*** discloses a natural language translation system for a human/computer interface (column 2 lines 15-18), and is therefore analogous art.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to submit unresolved utterances to winning handlers of a previous utterance for decoding in ***Ramaswamy***, since it would enable the system to continue

processing in the case of a deadlock or tie, as indicated in ***Amirghodsi*** (column 39 lines 11-15).

Claims 7-9, 18-20 and 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over ***Ramaswamy*** in view of ***Ramaswamy2*** ("A Pervasive Conservational interface for information interaction" Eurospeech 99).

As per claims 7, 18 and 27, ***Ramaswamy*** discloses the method as recited in claims 1, 12 and 23, however ***Ramaswamy*** does not disclose the step of maintaining a database of a history of handler selections. ***Ramaswamy2*** discloses a system that maintains a database of a history of handler selections (section 2.2 Conversational System, third paragraph, *a multimodal history captures all conversational and graphical system events, and keeps track of the system state*).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to maintain a database of a history of handler selections in ***Ramaswamy***, in order to improve the natural language understanding system for the predictable result of enabling standard disambiguation and reference resolution, especially when many transactions are open, as indicated in ***Ramaswamy2*** (section 2.2 Conversational System, third and fifth paragraphs).

As per claims 8, 19 and 28, ***Ramaswamy*** in view of ***Ramaswamy2*** disclose the method as recited in claims 7, 18 and 27, however ***Ramaswamy*** does not disclose wherein the history includes time based ordering and ontological information. ***Ramaswamy2*** discloses wherein the history includes time based ordering and ontological information (section 2.2 Conversational System, third paragraph, *a multimodal history captures all conversational and graphical system events, and keeps track of the system state*).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use a history that includes time based ordering and ontological information in ***Ramaswamy***, in order to improve the natural language understanding system for the predictable result of enabling standard disambiguation and reference resolution, especially when many transactions are open, as indicated in ***Ramaswamy2*** (section 2.2 Conversational System, third and fifth paragraphs).

As per claims 9,20 and 29, ***Ramaswamy*** in view of ***Ramaswamy2*** disclose the method as recited in claims 7,18 and 27, however ***Ramaswamy*** does not disclose the step of resolving unresolved utterances by employing information stored in the database. ***Ramaswamy2*** discloses resolving unresolved utterances by employing information stored in the database (section 2.2 Conversational System, sixth paragraph, *the multimodal history is used for disambiguation and reference resolution*).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use the information stored in the database to resolve unresolved

utterances in ***Ramaswamy***, in order to improve the natural language understanding system for the predictable result of enabling standard disambiguation and reference resolution especially when many transactions are open, as indicated in ***Ramaswamy2*** (section 2.2 Conversational System, third and fifth paragraphs).

(10) Response to Argument

Appellant argues that ***Ramaswamy*** does not disclose the elements of independent claims 1, 12 and 23, more specifically stating that, "Ramaswamy doe not teach or suggest the preceding limitations of claims 1, 12 and 23, but instead involves a multi-tiered approach that, at a first stage, only outputs a target category for an utterance, but not a target utterance" (Appeal Brief page 13); however the examiner respectfully disagrees. It appears that appellant is equating each translator level in ***Ramaswamy*** (see Figure 2, item 102, *translator levels 1- N*) with a stage, and thus the first translator level with a first stage. However, the examiner notes that this is not the only reasonable interpretation available. In ***Ramaswamy*** the input command is passed to translator levels (handlers), where each level interprets the utterance and assigns it to a category and corresponding formal language command(s). Once the input has been passed through the translator levels (handlers) a formal command is output at the final translator level, or first stage (Figure 2, and column 2 lines 25-65). As noted by appellant, ***Ramaswamy*** discloses that each translator level performs a portion of the translation process, with the N translator concluding the process and outputting the formal command (column 5 lines 43-50). ***Ramaswamy*** does disclose a hierarchical

translation process; however, the hierarchical translation steps combine to output a formal command at a first stage at the final translator level. Thus ***Ramaswamy*** discloses “the results provided at a first stage by at least one of the at least two of the plurality of handlers include one or more target utterance for the utterance" as recited in claims 1, 12 and 23.

Appellant also argues that, “Ramaswamy does not teach or suggest the use of arbitration at all, but rather simply selects the category with the highest score.” (Appeal brief page 16). Appellant also asserts that, "in arbitration, a person or thing acts as a judge to make a choice based on discretion"(Appeal brief page 17), this usage of arbitration based on the definition provided by Webster’s New World Dictionary of the American Language. However, the examiner continues to assert that this interpretation of arbitration is not supported in the specification. Appellant has pointed to page 14 of the specification as allegedly providing support for the argument that “arbitration” is "discretionary", however the examiner notes that this is only part of disclose describing arbitration. The specification, page 11, states that, “The handlers 20 decide among themselves what the intended target is by comparing features in the utterance to content stored in each handler to determine a highest score (which may include weighting and other score modification techniques, which may be known in the art). The handlers 20 are organized into a hierarchy as illustratively shown in FIG. 2. A database 204 is included to provide additional information in determining a winning handler for execution of commands”. The specification also states that, “Each handler, in its definition, is provided with a list of utterances it may understand. Since the utterance as

represented here, is a semantic parse, such a list of utterances is actually a list of concepts and may be defined quite concisely" (Specification page 13), we well as that questions are posed to each handler, as stated by appellant; however the specification continues to state that, "each enabled handler responds in the affirmative or the negative" to the questions posed to it (page 13). Thus, winning handlers, to be used to execute commands, are determined with the use of binary responses to questions, the responses determined by scoring amongst the handlers; these methods do not support the interpretation of arbitration, as argued by appellant.

Appellant also argues that, "while claims 1, 12 and 23 recite identifying/determining **a winning handler**, the cited portion of Ramaswamy discloses selecting a category (and not a winning handler as recited in these claims)", however the examiner respectfully disagrees. In ***Ramaswamy***, the input command is passed to translator levels, each level then interpreting the utterance and assigning it to a category and corresponding formal language command(s) (winning handler), based on a probability of correct translation for each of the categories associated with that translator level. If a translator error is encountered, a do nothing category is selected (column 2 lines 59-65). Upon output at the last translator level, the translator level (handler) with a do nothing output does not contribute the determination of a final formal command. Thus ***Ramaswamy*** discloses, "identifying/determining a winning handler" as stated in claims 1, 12 and 23, where the winning handlers are translator levels that output a category and corresponding formal command, as opposed to a do nothing command.

Appellant also argues that ***Ramaswamy*** does not disclose or suggest that the, "command is decoded in accordance with the winning handler identified by arbitration" since, "Ramaswamy does not output a formal language command corresponding to the handler (translator level) but rather then associates the selected category with a next level of translators and ultimately output the formal language command from a last level of translators." (Remarks page 14). However, the examiner respectfully disagrees. In ***Ramaswamy***, the input command is passed to translator levels, each level then interpreting the utterance and assigning it to a category and corresponding formal language command(s) (winning handler), the category determined based on the probability of a correct translation. The identified category and corresponding formal command (winning handler) is then used in the next level of continued translation. If a translator error is encountered, a do nothing category is selected (column 2 lines 59-65). Upon output at the last translator level, the translator level (handler) with a do nothing output does not contribute the determination of a final formal command. Therefore ***Ramaswamy*** discloses "decoding the command in accordance with the winning handler" as recited in independent claim 1, 12 and 23.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Dorothy Siedler

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